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CROP TALK

OMAF Field Crop Specialists—Your Crop Info Source

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Brought to You by the Following OMAF Crop Specialists

Mike Cowbrough Weed Management Program Lead
Hugh Martin, Organic Crop Production Program Lead
Horst Bohner, Soybean Specialist
Ian McDonald, Applied Research Co-ordinator
Albert Tenuta, Field Crop Pathologist
Keith Reid, Soil Fertility Specialist
Jack Kyle, Grazier Specialist
Brian Hall, Alternative Production Systems Specialist
Peter Johnson, Cereals Specialist
Scott Banks, Emerging Crops Specialist
Gilles Quesnel, Field Crops, IPM Program Lead
Christine Brown, Nutrient Management Program Lead
Adam Hayes, Soil Management Specialist - Field Crops
Greg Stewart, Corn Industry Program Lead
Tracey Baute, Entomology, Field Crops Program Lead

Editor: *Joel Bagg, Forage Specialist*

"Farming in Challenging Times!"

Marketing Mayhem!

by Peter Johnson, Cereal Specialist, OMAF

What a missed opportunity! Less than 8 months ago, every one of us had the opportunity to sell soybeans for $10.00/bu and corn for $4.00/bu. Yet the experts tell us that only 15% of the crop was sold at these levels. Today, after a dollar per bushel rally, I sold the last of my soybeans at a whopping $7.14/bu. Only $0.36/bu below my cost-of-production. What went wrong?

While prices were high last summer, none of us were very confident that we would have much crop to sell. On August 31st, half the soybean crop in the province could have been bought for 35 bu/ac, and most of the corn crop appeared in huge trouble from a maturity standpoint. Who would have guessed that we would harvest record crops? Regardless of the crop outcome, however, we had the tools to sell more at a better price. But the clutch was slipping, and that awful smell of burnt clutch is hanging heavy over us still.

How can you sell crop you won't have at harvest? WRONG ATTITUDE! Use the crop insurance tools available! Most estimates are that 80% of the crop in Ontario is covered by crop insurance. At an 80 % coverage level, 64% of the crop should have been sold at higher levels (80% times 80% = 64%). There is one and only one risk to this strategy - quality. And even that risk can be managed. The only essential elements are that you take out crop insurance, and you buy the floating price option.

Ontario Ministry of Agriculture and Food, Crop Technology Branch

Agricultural Information Contact Centre: 1-877-424-1300
Publication Order Centre: 1-888-466-2372
Northern Ontario Regional Office: 1-800-461-6132
OMAF Web Site: www.gov.on.ca/omaf/english/crops

Table 1 attempts to explain this further. For simplicity's sake, I have assumed an average farm yield of 40 bu/ac, at 80% coverage, giving a guaranteed production of 32 bu/ac. As long as you don't contract more than your guarantee, you have covered your risk. Whatever price you have locked in for your crop, that is what you will be paid. What about quality? Know your grade discounts. If you contract at $9.00 for a grade two, make sure the contract states what the penalty is for a grade 3 or sample grade. With grade discounts specified, all the risk is known.

Table 1 – Forward Contracting Soybeans With Crop Insurance

	Yield bu/ac		
	24	**32**	**40**
Forward contract bu	32	32	32
Price / bu	$9.00	$9.00	$9.00
Gross Income	$288.00	$288.00	$288.00
Short bushels	8	0	0
Cost / bu	$11.00	$11.00	$11.00
Dollars out	$88.00	$0.00	$0.00
Crop insurance claim bu.	8	0	0
Crop insurance price	$11.00	$11.00	$11.00
Crop insurance proceeds	$88.00	$0.00	$0.00
Gross income after contract (short) & crop insurance	$288.00	$288.00	$288.00
Remaining bushels to sell	0	0	8

If it is all this simple, why don't we use this strategy every year, and why did I just sell the last of my soybeans at such a dismal price? Greed and fear! Or perhaps, just too little thought. When soybeans were $10.00/bu, no one would sell until they hit $11.00. GET OVER IT! The coffee shop boys will always have sold at a better price. In fact, using this strategy, most of the soybeans would have been sold by the time they hit $9.00. Reality check.....a profit at $9.00 is far better than the $7.00 many growers will settle for now.

One last note. Crop insurance sets the floating price over a three week period, and you may not know your exact yield when this price is set. So the examples used are simplified. But this is manageable risk. As long as you know the rules, you can play this game!

"Shoulda, coulda, woulda." Hindsight. But we simply must get better at taking advantage of the opportunities that present themselves. Low risk opportunities are rare in agriculture. This is one. Let's start using it to our advantage!!

Frost Seeding Cereals!

by Scott Banks, Emerging Crop Specialist, OMAF, Kemptville, and Peter Johnson, Cereals Specialist, OMAF, Stratford

A relatively new and successful innovation is the early seeding of spring cereals into frosted soil with a no-till drill. Frost seeding can have such a dramatic impact on yields that spring cereals can play a more prominent role in our crop plans.

More Yield!

Farmer experience with frost seeding has been 15 - 25% higher yields. Some have had *up to 50% more yield!* The earlier you can seed spring cereals, the better the yield! Acres seeded into frost reduce the work to be done as spring arrives, and are growing even if the spring is wet. Research and on-farm trials have being very successful, so the risk appears low. There are far more opportunities to frost seed than most growers believe.

Cereals are a cool-season crop. Cereals will germinate at soil temperatures of 4°C or less. While emergence is faster at higher temperatures, cereals do not suffer from cold temperatures during germination the way soybeans and corn do. Research has shown that delayed seeding of spring cereals results in yield losses of 1.5 bushels/acre/day or greater. Lodging potential increases with delayed planting dates, and test weights drop.

Wendy Asbil at Kemptville College, Dr. Duane Falk and Dr. Bill Deen at Elora, University of Guelph conducted frost seeding research with oat, barley and spring wheat varieties in 2003 and 2004. At the Kemptville location, results showed that frost seeding (April 12th) increased oat yields by 5% (4 bushels per acre) more then the early traditional seeding date (April 26th). With barley, the yield

advantage from frost seeding over the traditional early seeding was not as consistent, however the 1,000 kernel weight was higher with frost seeding. The lack of consistent results with barley may be contributed to barley's amazing ability to tiller and its greater susceptibility to "wet feet" syndrome. Farmer trials have shown better response to frost seeding with barley than the research trials. 2004 results at Elora show incredible advantages to frost seeding (Table1).

Table 1 - Frost Seeding vs Dry Soil Yields

	Yield Avg Frost	Yield Avg Dry Soil	% Yield Increase
Barley	60	54	10.0
Oat	128	110	16.7
Wheat	52	36	41.5

Falk & Deen, University of Guelph 2004

Grower trials have been successful on well drained, tiled fields, and poorly drained, untiled fields. The greatest advantage may be on the poorly drained fields, where normal seeding dates are delayed. Other advantages to frost seeding include spreading out the workload, increased weed suppression, reduced heat and drought stress, and earlier harvest. Frost seeding results in slightly reduced plant populations and slightly lower protein, so these factors need to be managed.

Steps To Frost Seeding Cereals

1. **Be Prepared.** Opportunities for frost seeding appear and disappear quickly. The ideal conditions are when:
   - there is little or no snow
   - the ground is no longer frozen
   - night temperatures drop to -2° to -7° C.
2. **Seeding** can often start by 10:00 p.m. and continue until the sun comes out, or the ground gets too hard. Aim for air temperatures of **-2 to -6**° C. Listen to your drill. As soil becomes frozen solid, the drill begins to sound like it is travelling over a gravel pit. STOP! Significant damage can occur when the ground is frozen solid.
3. **Avoid compaction or rutting**. Use equipment set up to minimize compaction under normal conditions. Tires at 6 psi inflation need less frost to carry than tires at 30 psi.
4. **Crop rotation** is important. Following soybeans is best. Do not grow wheat or barley following corn.
5. **Weed control is important.** Fields that have been sprayed with a fall burndown (glyphosate) work best, with no dandelion, chickweed or quackgrass pressure. Frost seeded crops are 1 to 2 weeks ahead of normal crops, thus weed control must be completed earlier to avoid yield loss from weed competition. Leaving dandelions and other perennials uncontrolled until the 10th of May is simply not acceptable.
6. **Use a no-till drill** that can slice into light frosted soil and place the seed into the bottom of the trench. Aim for a 1 inch seeding depth (1/2 inch is still okay). Don't worry about the seed slot closing. The slot will close when the frost comes out the following day. Grower experience with broadcast seeding on the soil surface has been extremely variable, and in some cases disastrous. Get the seed in the ground!
7. **Keep your seeding rate up.** Kemptville College research found a yield advantage to a higher seeding rate than the traditionally recommended seeding rates (Table 2). Field trials have not shown a need for higher seeding rates. Keep seeding rates at the high end of the range, or increase by 10% above the targeted plant population. This will compensate for the lower plant populations experienced.

Table 2 - Recommended Plant Populations for Cereal Crops

Target Plant Population		
Crop	**Plants/sq.m.**	**Seeds/acre (x1,000)**
Barley	250 - 350	1,000 - 1,400
Oats	200 - 300	800 - 1,200
Mixed Grain	200 - 350	800 - 1,400
Spring Wheat	300 – 400	1,200 - 1,600

OMAF Publication 811, Agronomy Guide for Field Crops

8. **Use a starter fertilizer.** Farm trials have shown a yield response of 8 bu/ac to seed placed starter fertilizer. When the soil is cold, phosphorus is less readily available. Use a

liquid or dry fertilizer with the seed, such as 50 to 100 pounds per acre of MAP. This might mean mixing the seed and the fertilizer together in the seed box.

9. **Use fungicide treated seed.** Seed germination and emergence is slower than traditional, dry soil seeding dates.

10. **Plant the headlands first**. Farmers who have done frost seeding will tell you that the wheel traffic lets the frost in even more, making the headlands difficult to plant into afterwards.

11. **Be prepared to topdress your nitrogen fertilizer, spray and harvest earlier.** Nitrogen should be applied at the 3 to 5 leaf stage. Annual weeds will be more advanced than traditional seeding dates. Frost seeded cereals will be ready to harvest about a week earlier than cereals seeded at a traditional seeding date. Delayed harvest can result in a lower grade.

Making the Most of Potash Applications

by Keith Reid, Soil Fertility Specialist, OMAF

In many fertilizer programs, the attitude towards potash was "put on lots...it's cheap". In the last year, however, potash prices have increased sharply. This, along with the tight margins in crop production, suggests we should look carefully at where we do, or don't need to add potash. This is not to suggest that potash is not important for crop production. It is critical for maintaining proper moisture balance in the plant, and plays an important role in disease resistance, standability, and grain yield and quality. We do, however, have opportunities for fine tuning applications.

Step 1: Know what your soil can provide

Most of the potassium taken up by your crop will come from the soil. It is tough to manage potash if you don't know what is available from the soil. This means you have to have a soil test. In general, tests from within the past three years will give a pretty accurate picture of what is in the soil. The exception is on very sandy soil, where crops like alfalfa, silage corn or tomatoes, that remove large amounts of potash, are grown. These soils should be sampled more frequently.

Low testing soils will respond to added potash almost every year, and the yield losses from inadequate potash can be large. It would be false economy to cut K rates on these fields. High testing soils will still occasionally respond to added potash, but only rarely would the response be large enough to pay for the fertilizer.

Do I need more on clay soils?

Some jurisdictions recommend higher rates of potassium on clay soils than on loams or sands, so we often get questions about why Ontario does not include this in our recommendations. There are two reasons why the recommendations for a clay soil might be higher:

1. the recommendation is based on building up soil tests (and it takes more potash to raise the soil test in a clay soil), or
2. there is evidence that crops actually respond to higher rates of K on the particular clay soils within a region.

One neighbouring state that does recommend higher potash rates on clays is Ohio. However, their field trials showed different response patterns depending on the part of the state. In southeast Ohio, the clay soils needed more potash fertilizer to reach optimum yields. In northern Ohio, on the lacustrine soils that are most similar to our soils in Ontario, there was no difference in potash requirements with clay content. Ohio decided to have one recommendation system for the whole state that included the clay content factor. Their trial results actually supported the Ontario studies that showed no difference in K requirements on clay soils.

The clay minerals in Ontario soils actually contain a huge reserve of potash that is slowly released. It could be argued that we will suffer less yield loss from cutting back on potash on clay soils than on lighter soils. The caution is that you need to know the fertility status of any soil before you start cutting back.

Will my crop fall down if I cut back on K rates?

An important role of potassium in the plant is maintaining cell turgor. It is well-known that stalk strength decreases, and lodging increases, where potassium is deficient. High nitrogen fertility increases lodging even further in this situation. This has led to recommendations for high rates of potash on any crop with high nitrogen requirements, often at a fixed ratio of nitrogen to

potash. The trouble with these recommendations are that trial results don't show any differences in standability with higher potash rates, as long as the crop is not deficient. Providing adequate K for yield will also provide adequate K for standability.

Can I cut rates by banding?
There have been some studies showing an advantage to banding potash fertilizer, particularly in no-till. The difference between banded and broadcast, however, is small. The biggest difference was between no fertilizer, and fertilizer applied by any method. The conclusion is that you cannot expect the advantage to banding with potash that we get with phosphorus. You will need to balance the small advantage we do get against the cost of applying the potash in a band, and the increased risk of salt injury to the crop.

Are there other sources of K that I can use?
High potash fertilizer prices focus our attention on alternative sources of this element. A rich source of potassium is livestock manure, particularly from cattle. Liquid dairy manure, for example, contains about 30 pounds of available potash per thousand gallons. Applying this manure to meet nitrogen requirements will provide enough potash to meet the requirements of even the most deficient soil. Sewage biosolids, on the other hand, have almost no potash.

Growing Corn with Less Nitrogen

by Adam Hayes, Soil Management Specialist – Field Crops, OMAF

The St. Clair District Soil and Crop Improvement Association ran a nitrogen project for five years from 2000 to 2004. A total of 44 plots were established. The project cooperators set up nitrogen rate strips in their fields. There were several nitrogen rates below their normal rate of nitrogen and one above the normal rate. The rates were used to determine the maximum economic rate of nitrogen (MERN) for the field.

The weather had its usual affect on the plots, so some yield data was not useful. There were about 25 plots where the MERN could be calculated. The MERN was within 14 lbs. N/ac of the cooperator's normal rate of nitrogen on five of the 25 plots. On ten of the 25 plots the cooperator had the opportunity to reduce nitrogen rates by 30 to 65 lbs. of nitrogen without reducing income on the field (refer to Table 1). Four of the remaining 10 cooperators had the potential to reduce the nitrogen rate on their field by 70 to 85 lbs. The other six cooperators had manure and/or red clover in the rotation and were able to reduce nitrogen rates 70 to 180 lbs of nitrogen per acre from their normal rate of nitrogen (refer to Table 2). In two cases the manure was able to supply the entire nitrogen requirement for the crop.

Table 1 - Fields where N rates could be reduced 30-65 lbs./ac – No manure

Location, year	Normal Nitrogen Rate (lbs. N/ac)	Maximum Economic Rate of Nitrogen (lbs. N/ac)	Potential Nitrogen Reduction (lbs. N/ac)
Lambton, 2004	150	120	30
Essex, 2002	150	118	32
Lambton, 2002	125	90	35
Kent, 2003	156	118	38
Kent, 2002	150	110	40
Kent, 2004	155	115	40
Lambton, 2001	150	97	53
Kent, 2002	130	75	55
Lambton, 2004	147	90	57
Lambton, 2000	140	76	64

Table 2 - Fields where N rates could be reduced 70-180 lbs. N/ac – Manure

Location, year	Normal Nitrogen Rate (lbs. N/ac)	Maximum Economic Rate of Nitrogen (lbs. N/ac)	Potential Nitrogen Reduction (lbs. N/ac)
Kent, 2003	70	0	70
Lambton, 2004	154	84	70
Essex, 2003	196	112	84
Lambton, 2003	160	65	95
Lambton, 2003	145	0	145
Essex, 2003	180	0	180

All growers apply an adequate rate of nitrogen to their field (except for the occasional mistake). In most cases there is some insurance built into the rate. With many growers, especially those who practice good soil management and have a good crop rotation, there is an opportunity to reduce nitrogen rates without having a significant impact on yield.

Looking for a Change? Consider Organic

by Hugh Martin, Organic Crop Production Program Lead, OMAF

How would you like to get over $20 per bushel for soybeans, or over $6.50 for corn? Those are some of the market opportunities for the 2005 crop. Market demand is quite high and has remained much greater than supply for many years. Of course price is only part of the equation. For the corn, soybeans, spelt and wheat there will be no pesticide, herbicide, or fertilizer to be applied. Of course, I am referring to the production of organic crops.

Yields

Some organic farmers report soybean yields similar to or slightly below conventional, and corn yields of over 100 bu/ac. Wheat yields will be down about 25 - 40% depending on variety and soil fertility. Yields for all crops can vary depending on your field conditions and your management successes.

No GMO

Organic farming generally uses newer varieties similar to conventional farming, but does not use any genetically modified (GMO) varieties. Organic crops should be grown from organically produced seeds. Grains and soybeans will require at least a 8 metre (25 foot) buffer zone to separate them from conventional crops. Corn will require a larger buffer to separate it from neighboring GMO fields. You will need to keep the crop separate at planting, harvest and storage, especially the equipment, if it is being used for both conventional and organic. Some farmers have separate combines and planters so that there is no chance of mixing with seed treatments or non-organic crops.

Weed Management

Weed management is critical for organic farmers since they are not using herbicides. Crop rotation, cover crops, and planting to get quick emerging vigorous crops are strategies to suppress weeds. In row crops, using a rotary hoe or weeder (tine) harrow a couple times, and inter-row cultivation (once or twice) are tools to mechanically remove weeds. Correct timing and equipment setup is critical to success. In my observation many organic farmers are doing well at keeping weeds under control.

Soybeans & Spelt

Soybeans and spelt are the two most popular crops on organic farms. Spelt is a fall-seeded grain very similar to wheat. Yields are 1 - 1.5 tonnes per acre. Spelt currently sells for approximately $400 per tonne. Europe is a significant market for our spelt crop. Soybeans are mostly sold in the food markets of the US or Asia. Quality at harvest is essential to get top prices. In recent years, the feed grade market for soybeans has been around $14 per bushel. Organic livestock production is expanding, and so is the market for organic feed grains, including barley, corn, oats as well as the forage crops.

Certified Organic
How does one get involved in organic farming? First of all, do your research. Talk to other organic farmers. Join an organization, such as the Ecological Farmers Association of Ontario (www.efao.ca) or Canadian Organic Growers (www.cog.ca). Talk to one of the companies who market organic grains, such as Great Lakes Organic, Wehrmann Farms, Saugeen Specialty Grains, Homestead Organic, SunOpta, or Thompsons.

Transition Period Required
Buyers of organic grains will want you to be "certified organic". There are two main companies that currently certify in Ontario - Organic Crop Producers and Processors (OCPP) and GarantieBio Ecocert. Standards between the two are very similar. They require that fields have been managed organically for 36 months prior to harvest of the certified organic crop. Therefore there is a 2 or 3 year transition period where yields will be suppressed and organic premiums are not available. It is best to plan on forages or low input cereal grains for the transition period. Growers need to apply for inspection during the second transition year, and then to apply for certification and inspection each year to maintain organic status. The cost of certification is about $500 - $1000 per year, depending on the size and diversity of the farm.

Cover Crops & Rotation
Cover crops are always encouraged in organic production programs. Legumes are used to build organic matter and to increase the soil's capacity to supply nitrogen. Rye is commonly used to build organic matter and to suppress weeds. Crop rotations are essential on organic farms. Good crop rotations reduce weed problems and help to build soil organic matter.

Opportunities
Organic has many opportunities and can offer alternatives to conventional crops. For more information visit the OMAF website at http://www.gov.on.ca/OMAFRA/english/crops/organic/organic.html.

Minimizing Weed Control Costs in Field Corn

by Mike Cowbrough, Weed Specialist, [illegible], Guelph

It is instinctive to want to minimize production costs, especially in years of low commodity prices. Reducing weed control costs is possible, but it requires a higher level of management to maintain weed control and crop yield. Keep in mind that herbicide costs are relatively small compared to the economic losses that can be caused by uncontrolled weeds. Simply switching to low cost herbicides will not work unless the herbicide addresses the spectrum of weeds in a field, or is combined with other weed control tools, such as timely tillage.

Before altering your weed management program, ask yourself the following:
- How well do I know the weed infestations in my fields?
  i.e. species, time of emergence, and density
- What programs have I used in the past and have they been successful?
- Am I able to cultivate, or apply herbicides in a timely fashion?

How do I develop a long-term, low cost weed management system?
I have chosen to focus on three low-risk management options that will aid in the quest for reduced weed control costs. Obviously there are other opportunities to cut cost (i.e. reduced rates), however these strategies come with much higher risk.

1. Scout fields and identify weed species, density and time of emergence.

This seems pretty basic, but it is amazing how this information can provide you with the opportunity to lower weed control costs. For example, one field at the Woodstock Research Farm has a history of heavy lamb's-quarters and pigweed pressure, with a very low amount barnyardgrass. Given this weed spectrum, in 2003, field corn was planted and we targeted the two broadleaf weeds with an early application of Marksman and then took a wait-and-see approach with the grasses. In this particular example, this saved us the price of a post-emergent grass herbicide (about $22/ac). If grasses had come up later, we still would have

had the flexibility to go in with an appropriate grass herbicide or tillage.

2. Pick the most cost-effective weed management program

Let's be honest. Comparing the cost of herbicide programs is almost impossible because manufacturers will offer numerous rebate programs based on the quantities of herbicide or seed purchased. I have attempted to provide you with lists of herbicides in different price ranges (before program rebates), and some of the pros and cons associated with each program (refer to "Low Cost Herbicide Programs For Field Corn – Strengths and Weaknesses"). Hopefully this provides you with some options that perhaps you haven't considered before.

Several other factors should be considered when selecting a herbicide program:

- crop safety,
- flexibility in application timing,
- consistency in performance,
- seed costs associated with herbicide (e.g. Roundup Ready Corn) and
- rebate incentives – there not going away, so use them to your advantage.

3. Review past successes and failures.

Attempting to reduce weed control costs may result in some successes and failures. It is important to learn equally from both. For example, I have been burned in the past by selecting a low cost herbicide program that provided great control of the annual weeds, but unfortunately perennials were present that I did not know of. This illustrates the importance of scouting and documentation.

Alternatively, there have been fields where I applied the "Cadillac" of weed control programs, only to notice that in a small section were I didn't have the spray boom turned on (I could call this my untreated check, but I'll be honest - I screwed up!), the weed spectrum indicated that a lower cost program would have been as effective as the more expensive one. Bottom Line - know what you have and tailor a herbicide program accordingly.

What about "Roundup Ready" Corn for reduced weed control costs?

From an input cost perspective, Roundup Ready corn is very competitive plus it offers exceptional weed control, crop safety and application flexibility (Table 1). However, it is important to manage this technology appropriately in terms of glyphosate resistant weeds or weed shifts. An overuse of any one herbicide program will eventually result in weed management challenges. Provided yield is comparable to conventional hybrids, Roundup Ready corn has a very nice fit in management systems that have forages or if one is growing "IP" and conventional soybeans in a rotation.

Table 1 - Comparing costs of a RR corn system using glyphosate + atrazine for weed control versus a conventional system using Converge.

	37R70 (RR)	37R71 (Conv.)
Additional Seed Costs($/ac)	**8.46 $/ac**	----------
Herbicide ($/ac)	**15.59 $/ac** glyphosate + atrazine	**28.00 $/ac** Converge
Application Costs ($/ac)	**9.00 $/ac**	**9.00 $/ac**
TOTAL ($/ac)	**33.05 $/ac**	**37.00 $/ac**
Additional yield (bu.) needed to cover higher input costs	**0 bu.**	**1.49 bu.**

Assumption - new crop corn price at $2.65/bu.

What does the above comparison tell us?

- Seed and Herbicide Costs are cheaper under the "Roundup Ready" system (before any program rebates).
- That the conventional system would need to generate 1.49 bu/ac more than the "Roundup Ready" corn system to off-set the additional seed and herbicide costs.

What doesn't the above comparison tell us?

- Whether the above two hybrids yield the same. This is an important consideration that should be researched before deciding on a seed/herbicide system. In the above comparison, according to the 2004 Corn Hybrid Performance Trials corn yields between the two are comparable. (www.gocorn.net).

Other Resources:

- Glyphosate stewardship in Ontario: www.plant.uoguelph.ca/resistant-weeds

Low Cost Herbicide Programs For Field Corn – Strengths and Weaknesses

by Mike Cowbrough, Weed Specialist, OMAF

Below is a summary of some of the "lower cost" herbicide options for field corn on the market. The fit that each of these programs has on your farm will depend on how well you know the following:

- The weed infestations in each field,
  - i.e. species, time of emergence and density
- Soil Type in the target field (for soil applied herbicides)
  - Heavy textured soils that are high in organic matter usually require a higher rate.
- If weeds that weren't on the product label emerge later, am I able to deal with them?
  - Either with cultivation or a timely follow-up herbicide application.

Herbicide Program Under $20/acre

Product	Application Timing*	Considerations
Axiom (low rate)	PRE	Grass Control – limited broadleaf control (about 5 broadleaf species). Low rate may not be effective on certain soil types and with heavy weed pressure.
Axiom + atrazine (low rate)	PRE	Grass and Broadleaf weed control. Triazine resistant weeds like lamb's-quarters are not controlled. Low rate may not be effective on certain soil types.
Banvel II (high rate)	PRE	Only provides broadleaf and some perennial weed control.
Dual II Magnum (low rate)	PRE	Grass Control, broadleaf control limited to nightshade and pigweed. Low rate may not be effective on certain soil types and under heavy weed pressure.
Frontier (low rate)	PRE	Grass Control, broadleaf control limited to nightshade and pigweed. Low rate may not be effective on certain soil types and under heavy weed pressure.
Glyphosate + atrazine (RR corn only)	POST	Broad spectrum control. Residual control on a limited number of weeds.
Glyphosate + Marksman (RR corn only)	POST	Broad spectrum control. Residual control on a limited number of weeds.
Marksman	PRE/POST	Provides mainly broadleaf and some perennial weed control.
Primextra II Magnum (Low Rate)	PRE	Grass and Broadleaf weed control. Triazine resistant weeds like lamb's-quarters are not controlled.
Prowl 400	PRE	Grass Control – limited broadleaf control (about 3 species)

*Refers to the application timing relative to weed emergence.

Other considerations include crop safety, application flexibility and additional seed costs (i.e. Roundup Ready corn).

Herbicide Programs Under $10/acre

There are numerous broadleaf herbicide programs under $10/ac. However, they are unlikely to offer complete season-long weed control unless tillage or a follow-up herbicide application is incorporated into the weed management program.

Herbicide Programs Under $20/acre

There are few herbicide programs under $20/ac that offer a broad spectrum of weed control. The fit for many of these programs is in fields that have relatively low weed pressure with a limited number of different species that are controlled by the selected herbicide. For example, Prowl may be a very appropriate herbicide choice provided the weed spectrum in the field is limited to the weeds on the Prowl label.

Herbicide Programs Under $30/acre

As the price of a herbicide program increases so generally does the number of weeds controlled. There are a number of weed control programs under $30/ac that will offer both grass and broadleaf weed control.

Summary

A very real opportunity exists to minimize weed control costs. It is accomplished by either scouting fields yourself or hiring a crop consultant to do so for you. Often unnecessary weed control costs are avoided by knowing exactly what weed species are in the field, then targeting control with a herbicide that specifically addresses those weeds.

Resources

OMAF Publication 75 – "Guide to Weed Control"
(to find go to www.google.ca and search: "Guide to Weed Control")

Herbicide Program Under $30/acre

Product	Application Timing*	Considerations
Accent	POST	Grass Weed Control and pigweed control. Will not control group II resistant weeds
Axiom (High Rate)	PRE	Grass Control – limited broadleaf control (about 5 broadleaf species). High rate shouldn't be used on coarse textured soils low in Organic matter.
Battalion (Post Rate only)	POST	Grass and Broadleaf weed control.
Converge (low rate)	PRE**	Grass and Broadleaf weed control.
Dual II Magnum (High Rate)	PRE	Grass Control, broadleaf control limited to nightshade and pigweed.
Frontier (High Rate)	PRE	Grass Control, broadleaf control limited to nightshade and pigweed.
Liberty (Liberty Link corn only)	POST	Grass and Broadleaf weed control. Top-growth control of some perennials.
Option 35 DF	POST	Grass control and limited broadleaf control. Will not control group II resistant weeds
Option 35 DF + atrazine	POST	Grass and Broadleaf weed control. Will not control
Option 35 DF + Banvel II	POST	Grass and Broadleaf weed control.
Primextra II Magnum (High Rate)	PRE	Grass and Broadleaf weed control. Triazine resistant weeds like lamb's-quarters are not controlled.
Prowl + atrazine	PRE	Grass and Broadleaf weed control.
Ultim	POST	Grass Weed Control and pigweed control. Will not control group II resistant weeds

*Refers to the application timing relative to weed emergence.
** Converge must be applied prior to corn emergence.

2005 Problem Weed CD – contact Mike Cowbrough 519-824-4120 ext 52580 or mike.cowbrough@omaf.gov.on.ca

Selected Manufacturer Web Sites:
BASF – www.agsolutions.ca
BAYER – www.bayercropscience.ca
DOW AGROSCIENCES – www.dowagro.com/canada
DUPONT – www.dupont.ca/ag
MONSANTO – www.monsanto.ca
SYNGENTA – www.farmassist.ca

Minimizing Soybean Inputs!

by Horst Bohner, Soybean Specialist, OMAF, Stratford

Where can a grower cut back on inputs and when is it important to stay the course? Here are a few points to consider.

1. **Nutrients**

Apply only the nutrients absolutely necessary. In many situations that means no fertilizer is necessary at all. If manure is available, consider using it for soybeans as well as corn ground. While this is not the best use of the available nitrogen in the manure, since corn would utilize it more efficiently, don't be afraid of applying a reasonable amount of manure for soybeans. Some producers fear that manure will prevent proper soybean nodulation. This only occurs in extremely high nitrogen cases and is not a major concern for most Ontario situations. Each field is unique, but many soybeans receive unnecessary P and K each year. With the exception of Manganese in deficient fields foliar fertilizers have not proven to significantly improve yields.

2. **Seed Costs**

Consider reducing seed costs. If you're drilling 7 inch rows, block off every other run. The difference in yield between 7 and 14-inch rows is marginal, but the seed savings can be considerable. If a fungicide seed treatment is being used and field conditions are good, consider reducing seeding rates another 10%. Going to 15 inch rows may also increase emergence if crusting becomes a problem. In heavy white mould years there is the added benefit of increased air movement with wider rows. If buying certified seed, choose smaller seed size lots to make each bag go further.

3. **IP**

The prospects of IP have been exaggerated by some in the past, but that doesn't mean there aren't opportunities for additional profit with IP contracts. The key is to take into consideration the yield potential of the variety being grown, the extra costs involved, and the additional risks. Each operation is different, so there are no quick answers to the economics of IP soybeans.

4. **Scout For Rust & Aphids**

The days of planting soybeans and forgetting about them until harvest are gone. Whether we like it or not, scouting for disease and pests has become a must for soybeans. Although we were spared an aphid outbreak in southwestern Ontario in 2004, eastern Ontario was one of the few pockets in North America hit with heavy populations. Of 26 side-by-side comparisons, an average advantage of 5 bushels per acre was realized when aphids were sprayed. This was despite the fact that most of eastern Ontario did not suffer from any lack of moisture. That goes to show that even when stress is minimal on soybean plants, aphids can significantly reduce yields. Soybean aphid populations above threshold must be controlled for maximum profits.

5. **Variety Selection**

Don't compromise on variety selection. The single most important yield increasing decision you can make is to choose the varieties best suited for your fields. A tremendous effort is spent each year to gather yield data for Ontario varieties. Take advantage of this information. Refer to www.soybean.on.ca for the 2005 variety trial data.

Re-Thinking Soybean Row Widths

by Horst Bohner, Soybean Specialist, OMAF, Stratford

In the early years of narrow row adoption, drills (7.5 inch row spacing) became the planting implement of choice across much of Ontario. Intermediate rows (15-inch spacing) were not as widely promoted or adopted. In some parts of the US intermediate row widths have become more popular compared to 7 inch rows. Several factors

have influenced the switch away from narrow to intermediate row widths:

1. High cost of glyphosate tolerant seed
2. One piece of equipment being able to plant both corn and soybeans
3. Better emergence in wider rows
4. White mould
5. Little yield benefit comparing 7 to 15 inch rows

Yield Impacts

As row widths are narrowed, yield increases follow the law of diminishing returns. As you move from 30 to 20 inch rows the yield increases are the highest, but as you move from 20 to 15 inch rows the benefits are less evident. Moving from 15 to 7 inch rows shows little or no benefit. Ontario research has shown a yield increase of over 5 bu/ac between 30 inch rows and 15 inch rows, but as little as 0 bu/ac or slightly over 1 bu/ac between 7.5 and 15 inch rows. Refer to Table 1. Narrow rows would likely show more benefit in lower CHU zones (less than 2600) and late planting. It's also important to note that these research trials don't contain white mould. Better emergence with wider rows and the presence of white mould may actually favour 15 over 7 inch rows.

Where the difference between 2 treatments exceeds 2.4, there is a less than 1 in 20 chance that it is due to random variation. University of Guelph (1998-2000). Average of 9 sites per year. Trials were conducted on clay loam, silty – clay loam, silt loam, and Guelph loam soil types.

Studies in the US have shown similar results, of little or no benefits of 7 inch over 15 inch rows. Refer to Table 2.

Table 2 - Adjusting Management Practices Using Glyphosate-Resistant Soybean Cultivars

Row Width	Southern Wisconsin	Central Wisconsin	Northern Wisconsin	Average (bu/ac)
7.5"	66.5	59.6	49.7	58.6
15"	69.6	60.4	49.8	59.9
30"	63.2	54.4	44.9	54.2

G. Bertram, P. Pedersen, 1997-1999

Switch From 7" to 15" Rows?

About 60% of the Ontario soybean acreage is now planted with glyphosate tolerant varieties. The cost of Roundup Ready seed continues to increase, and is now in excess of $50.00 per acre. Can seeding costs be significantly lowered by switching from 7 to 15 inch rows?

If a producer would switch from 7 inch rows to 15 inch rows, they would save $7.00 per acre in seed costs (reducing seeding rates from 225,000 to 200,000 seeds per acre). This assumes a $37.00 per unit cost of Roundup Ready seed with 2600 seeds/pound.

Seed Treatment Increases Plant Stand

Seeding rates could likely be reduced even further if the seed is treated with a seed treatment. Recent Ontario research has demonstrated a stand increase of between 5 to 25% when using a fungicide seed treatment. Although soybean fungicide seed treatments don't always show a yield advantage, plant stand increases are consistently demonstrated. With the use of a fungicide seed treatment it may be possible to reduce seeding rates while maintaining the number of plants per acre at harvest time.

Table 1 - Soybean Yield Response Under Various Tillage Systems

	Row Width cm (inches)				
	76 (30)	**Twin 76 (30)**	**56 (22.5)**	**38 (15)**	**19 (7.5)**
Tillage	**Soybean Yields t/ha Bu/ac**				
No-till	2.72 40.4	3.04 45.3	2.93 43.6	3.06 45.5	3.06 45.5
Fall Moldboard	2.94 43.8	3.02 44.9	2.93 43.6	3.12 46.4	3.21 47.7

Seeding Rates
Ontario Ministry of Agriculture and Food row width/ seeding rate recommendations are:

225,000 seeds/acre in 7 inch rows,
200,000 seeds/acre in 15 inch rows,
170,000 seeds/acre in 22 inch rows,
160,000 seeds/acre in 30 inch rows.

However, the above recommendations are based on research that was conducted with conventional varieties, untreated seed, and with less precise planting equipment than is now available. Several studies have shown that for most soil types there is little economic benefit to having more than 150,000 plants/acre at harvest time for maximum economic yields. If a fungicide seed treatment is used this stand is often achievable with a seeding rate of 175,000 seeds/acre in 15 inch rows. Many US states recommend a seeding rate of 175 000 seeds/acre in 15 inch rows.

In-field Spraying Trips
With the introduction of soybean aphids to Ontario in 2001 and the possible invasion of soybean rust in 2005, more in-field spray trips will be required in the future. This is another reason to consider moving away from narrow rows to intermediate row spacing.

Is a 15" Planter better than a 15" Drill?
No Ontario data is available on this subject. However trials conducted in Indiana have shown that if a drill is driven at the same speed as a planter (i.e. not at 8 MPH) yields are the same between the two pieces of equipment. If drills are pulled too quickly, seed placement becomes less accurate and may have a negative impact on yields.

Considering the cost of Roundup Ready seed and the widening popularity of fungicide seed treatments on soybeans, it is necessary to reconsider the most cost-effective use of that seed. For many Ontario producers, that may mean planting 15-inch rows instead of 7-inch rows.

Finding Extra Pasture

by Jack Kyle, Pasture Specialist, OMAF

Are you one of the many producers who will be carrying increased livestock numbers this pasture season? If this applies to your situation, there are a number of options to increase your pasture production this coming year. It is important to take steps early in the season to have the best opportunities to increase the amount of available pasture for the 2005 grazing season. What are the options?

1. Rotational Grazing
Rotational grazing will give increased forage production and increased gains per acre. Plants start to grow again about 5-6 days after grazing occurs. The key to rotational grazing is the rest period following the grazing. It is during this rest period that the plants have an opportunity to produce new growth and develop their root systems. The livestock should be removed from the field before this new growth is initiated. A sound rotational grazing system can result in 25-50% increased gains per acre. Gain per animal may not be any higher but the acreage will support more animals.

2. **Apply Nitrogen To Grass**
Nitrogen fertiliser will give a significant increase in grass growth in any pastures that contain less than 30% legume. Nitrogen should be applied in amounts of 40-50 lbs. of actual N per application. Applications should be 4-6 weeks apart. The first application should be made in late May or early June.

Earlier applications will increase the early growth, which usually exceeds the animal needs and becomes mature. If you are prepared to use the early season growth for stored forage, then you could make the first application in late-April or early-May, soon after the grass starts to grow. It has generally been found that in a stocker cattle situation, 1 lb. of nitrogen will produce 1 lb. of beef.

3. Sorghum-Sudan Or Corn After 1st Cut
In hay fields where the production level has decreased, consider taking the first-cut of hay and then plant sorghum-sudan grass or corn for grazing, green chop, or silage. Sorgum-sudan and corn are warm season grasses that will produce fairly well with a mid-June planting. You will have

the hay from the first-cut and the sorghum or corn for August/September feed. The corn could actually be left and then grazed in the fall/winter, until the snow is too deep for the livestock.

4. Turnips After Cereals
Early planted spring cereals could be harvested as forage or grazed. Then plant a brassica crop, such as turnips or fodder rape, to give late-season grazing. Cereals can also be planted later in the season (late-July to mid-August) for grazing in September and October.

5. Purchased Feed
Buy standing hay or baled hay to supplement your forage supply. Calculate your needs early and get your hay lined up so that it is cut at the optimum time for quality forage. First-cut hay made in July is going to have little nutritional value. Purchasing corn silage maybe another option that might work for you.

Supplement your livestock with purchased grain. Currently grain prices are at a low point and the grains do supply a high-energy ration supplement.

6. Ration Balancing
Balance your rations. Feed your livestock to their needs, do not underfeed and do not overfeed. Balanced rations are going to give you the most economical gains.

These are some ideas that can be utilised to increase your forage production in 2005. Early planning and careful utilisation of your pasture should make the grazing season a successful one, even with increased livestock numbers.

Annual Forages for Grazing or Stored Feed

by Scott Banks, Emerging Crop Specialist, OMAF, Kemptville

There are many reasons to look at using annual crops for forages. Winterkill looks likely this spring on forage stands in some parts of Ontario. Graziers also look for alternative forage crops to produce more forage during the typically expected mid-summer slump of traditional grass pastures.

Cereal crops, various forage mixtures, and warm season annual grasses (such as sorghum-sudan grass) can be used to produce quality forage for grazing or stored feed. The timing of production, quality, yield and growing costs of alternative forage crops need to be considered to determine which annual forage is best on your farm. Remember that feed is the number one cost on cow-calf and sheep farms. A well managed perennial forage stand can be productive and is still the lowest cost per tonne of any forage.

There are several annual crops that can be grazed or put up as stored feed. Potential annual forage crops include barley, oats, wheat, triticale, annual ryegrass (Italian and Westerwold), pea mixtures, corn silage, sorghum-sudangrass, sorghum hybrids, sudan hybrids, Japanese millet, pearl millet, forage soybeans and corn silage. To efficiency harvest these crops with livestock, strip grazing is a must in order to reduce wastage and to improve regrowth potential.

Cereal Regrowth
The regrowth after cutting or grazing of spring cereals, such as barley and oats, is variable. Oats has better regrowth than barley. Regrowth will also vary with the maturity of the cereal at first-cut. The more mature the cereal crop is at first-cut, the less regrowth. Low cutting height or over-grazing also reduces the regrowth. As with any crop, rainfall impacts regrowth.

Cereal Mixtures
Seeding in a mixture of species can provide a longer forage season and better forage quality than a spring cereal alone. A winter cereal crop seeded in the spring does not go through vernilization. Without vernilization, a winter cereal will not produce a seed-head during the first growing season. This vegetative growth has a greater leaf/stem ratio than a spring cereal. The other benefit of the intercrop system is it will give two to three harvests per year using the same tillage and seeding pass.

Research on seeding pure and intercropped mixtures was conducted in New Liskeard Agricultural Research Station. Table 1 outlines the seeding rates and Table 2 summarizes the dry matter yields of pure and intercropped mixtures. In pure stands, oats gave the best yield. The

intercropped mixture yields were statistically the same, but indicate that Oats + annual ryegrass mixtures should be looked at for the best season-long forage production for grazing.

Table 1 - Seeding Rates of Pure and Mixtures of Cereal

Crop	Pure Stands (lbs/ac)	Seeding Rate (lbs/ac)	Oat Seeding Rate (lbs/ac)
		Inter-cropped	
Oats	63		63
Fall Rye	63	50	50
Winter Triticale	68	54	50
Italian Ryegrass	23	18	50
Westerwold Ryegrass	23	18	50

New Liskeard Agricultural Research Station

Table 2 - Pure and Mixtures of Cereal Dry Matter Yield (tonnes/acre)

Crop	1st Cut July 20th	2nd Cut Sept 2nd	Total Yield
Pure Seeded	(DM t/ac)	(DM t/ac)	(DM t/ac)
Oats	2.40	0.97	3.36
Winter Rye	0.65	0.95	1.60
Winter Triticale	0.61	1.22	1.82
Italian Ryegrass	0.86	1.82	2.68
Westerwold Ryegrass	0.81	2.15	2.97
Intercrop with Oats			
Oats + Fall Rye	2.23	0.85	3.08
Oats + Fall Triticale	2.32	0.93	3.26
Oats + Rye + Triticale	2.04	0.85	2.89
Oats+ Italian Ryegrass	2.41	0.97	3.38
Oats + Westerwold Ryegrass	2.39	1.11	3.50

New Liskeard Agricultural Research Station

Pea Mixtures

Adding peas to a cereal mixture for forage has been shown to increase crude protein by 2 - 4%, and decrease NDF by 2 - 6%. To obtain this improved forage quality, a 50:50, peas:cereal mixtures needs to be seeded. Depending on pea seed price, this mixture can be costly. Peas are very competitive with underseeded perennial forages, so stand establishment is usually poor.

Warm Season Annuals

If forage seeding is delayed into late-May and June, warm season annual forages are more productive. Sorghum-sudan grass, hybrid pearl millet, hybrid sorghum, sudan grass and Japanese millet can be grown. These plants are frost sensitive and should be planted when the risk of frost has passed. Seed when soil temperatures have reached 12 to 15°C. Warm soil temperatures are important for quick emergence to be competitive against emerging weeds. A first-cut is ready about 60-65 days after planting and a second-cut can be cut or grazed 30 - 35 days after 1st cutting or grazing. Pearl millet should be planted only on a sandy to sandy–loam soil type. On heavier soils, hybrid sorghum, sudan grass or sorghum-sudangrass are better suited.

Livestock Needs & Feed Costs

Livestock needs are also important in selecting the annual forage species that is best for your farm. Forage yield and quality varies between crop species as well as harvest management. Table 3 provides a comparison of the dry matter yield, crude protein and total digestible nutrients (TDN) of several forage species. Figure 1 provides a yield and cost comparison of several annual forages.

Table 3 - A Comparison of the Dry Matter Yield, Crude Protein and Total Digestible Nutrients (TDN)

Species	DM Yield (tonne/acre)	Crude Protein	TDN
Corn	5.46	8.0	68
Annual Ryegrass	2.72	14.6	66
Sorghum	4.08	8.3	61
Sudangrass	3.77	12.2	59
Japanese Millet	3.40	10.1	56
Pearl Millet **	3.99	17.0	61
Soybean Silage **	3.56	13.5	71

**under good growing conditions

Use Your Own Assumptions & Costs

Note: Costs are calculated using current seed costs, recommended seeding and fertilizer rates, herbicides where appropriate, and custom rates for tillage and planting. They do not include any harvesting costs such as labour, fencing or cutting, silage or baling costs or land costs. You should use your own assumptions to calculate your options for your operation.

The right forage species for your farm will depend on your livestock's forage needs, the availability of equipment or custom operators, storage if required, how it compliments the other available feeds on your farm and the cost of each annual

forage option. As illustrated in Figure 1, a well managed pasture or perennial forage stand is still the lowest cost forage.

Further information sources include Agronomy Guide for Field Crops (OMAF Publication 811), Pasture Production (OMAF Publication 30) or the OMAF Forage Web Site at www.gov.on.ca/OMAFRA/english/crops/field/forages.html.

Figure 1 - Yield & Cost Comparison of Annual Forages